A. W. BROCK.

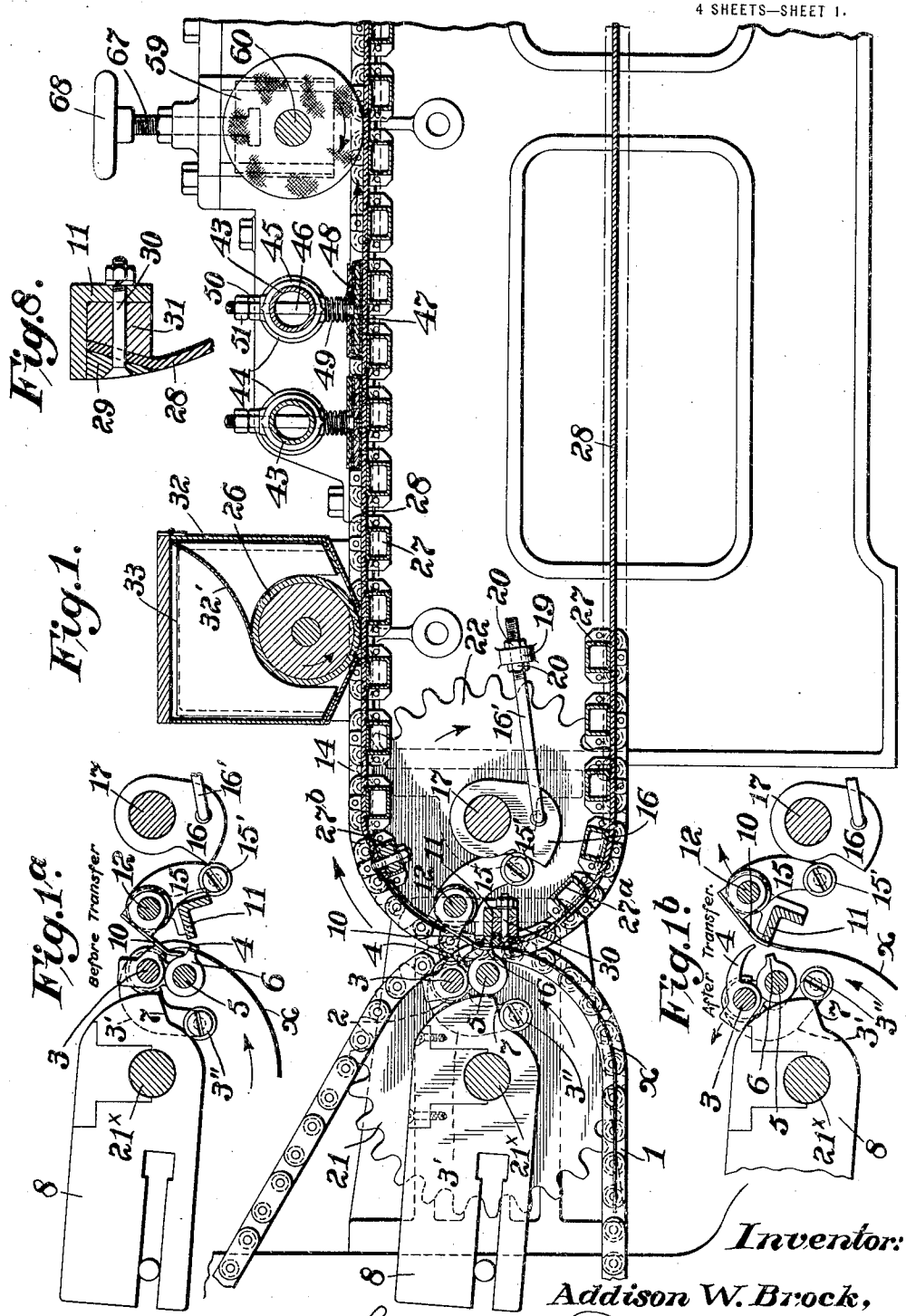
BRONZING MACHINE.

APPLICATION FILED JUNE 9, 1919.

1,354,018.

Patented Sept. 28, 1920.

4 SHEETS—SHEET 1.



Inventor:

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by Spear, Middleton, Donaldson & Hall

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4 SHEETS—SHEET 2.

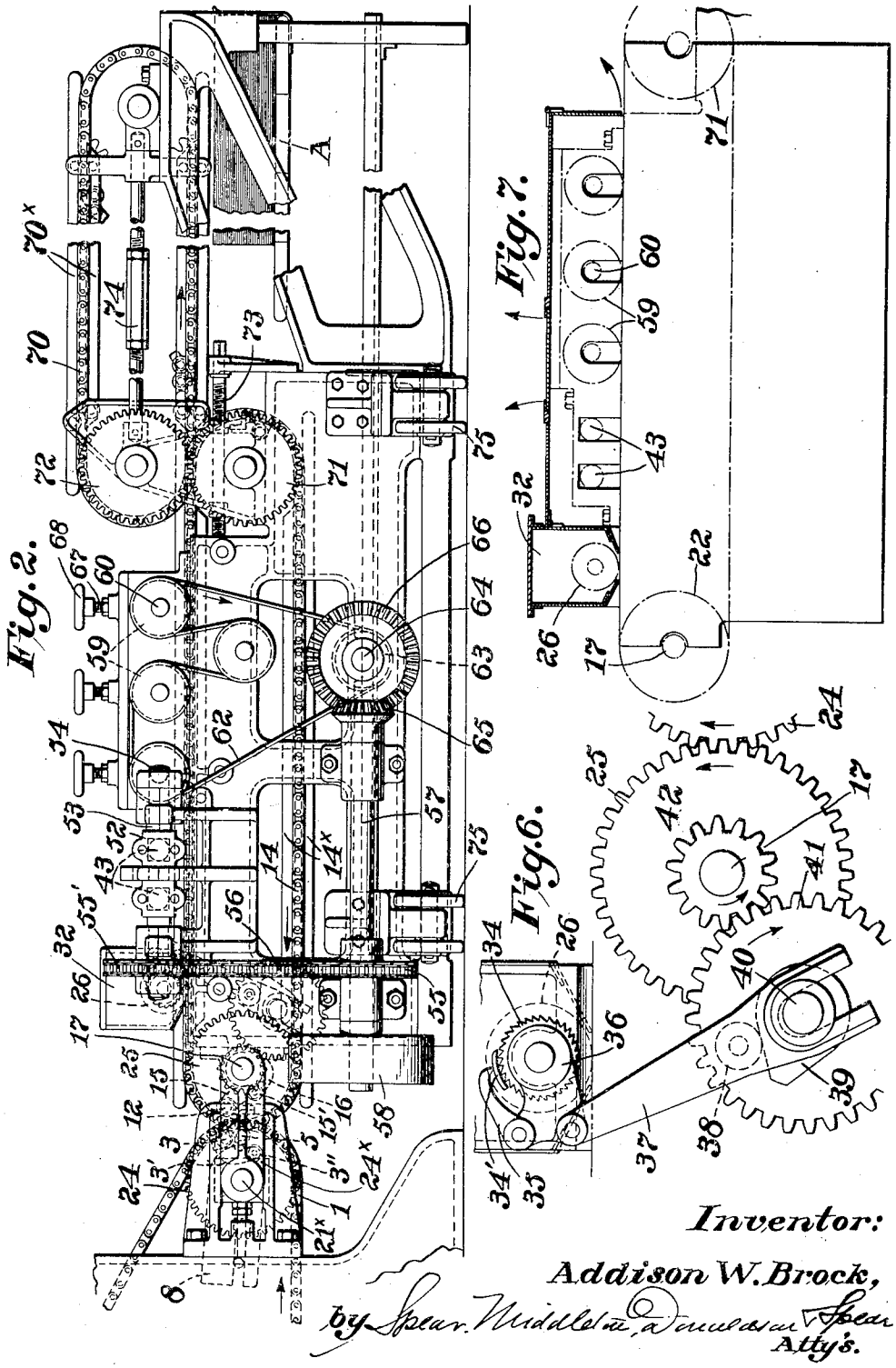


Fig. 2.

Fig. 7.

Fig. 6.

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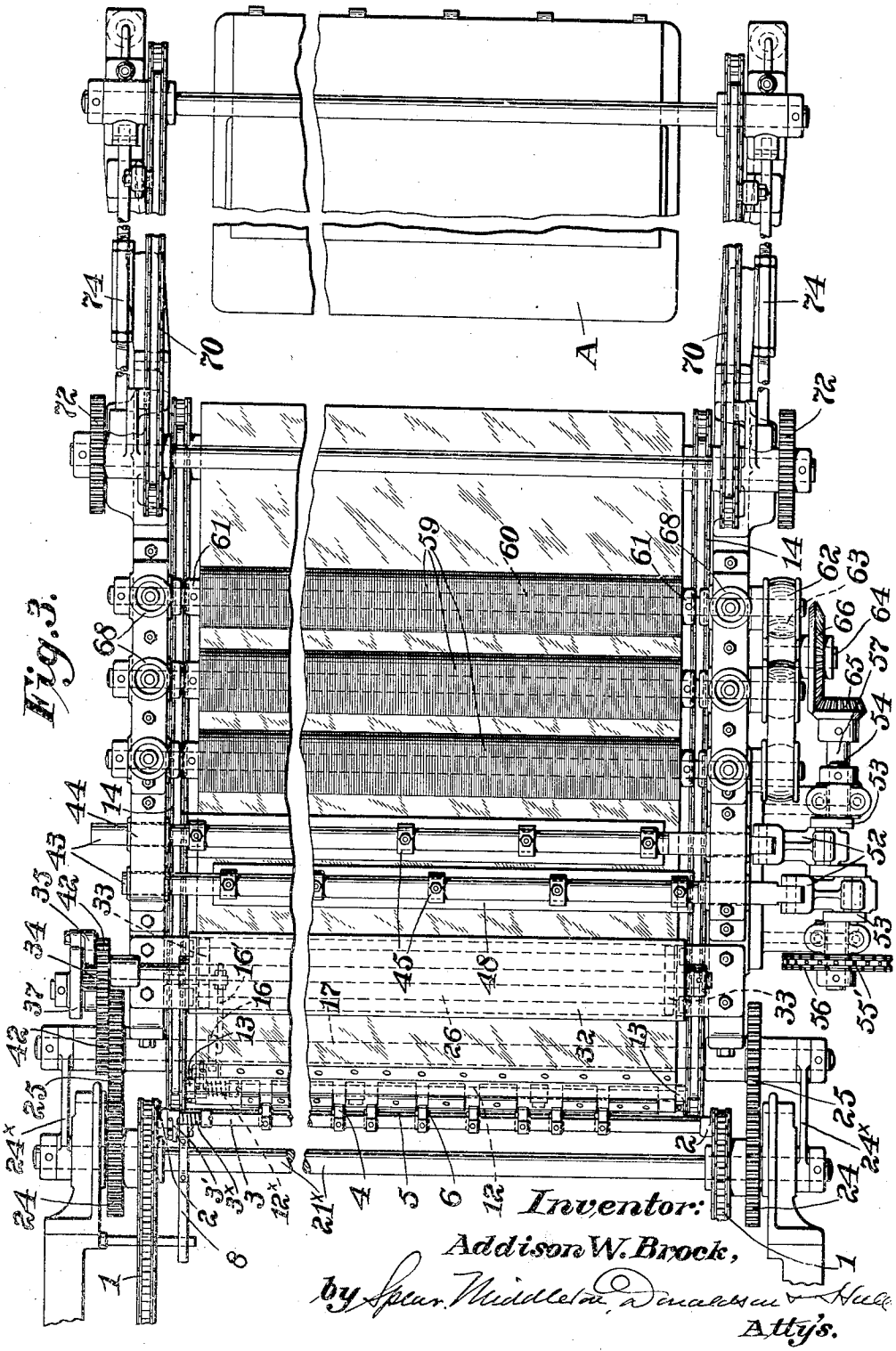


Fig. 3.

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4 SHEETS—SHEET 4.

Fig. 4.

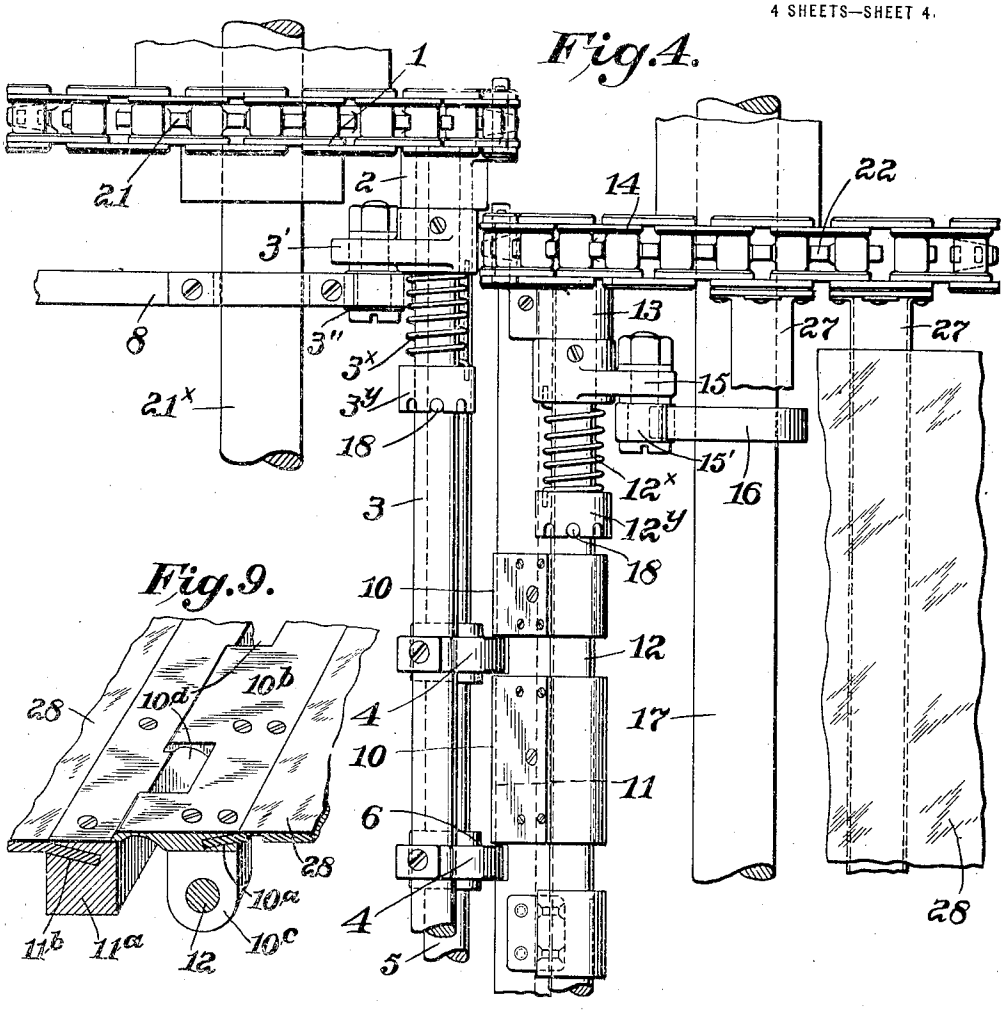
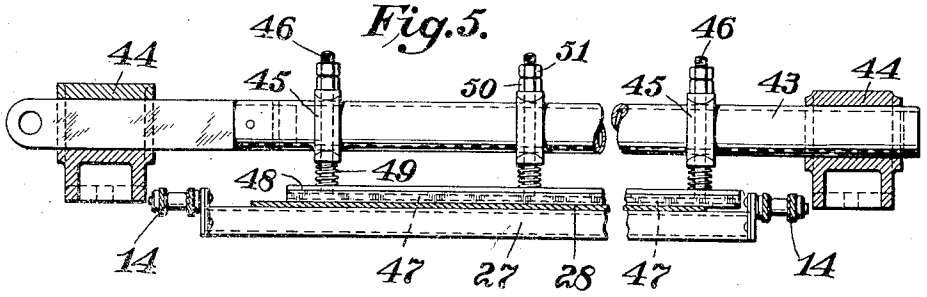


Fig. 9.

Fig. 5.



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UNITED STATES PATENT OFFICE.

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BRONZING-MACHINE.

1,354,018. Specification of Letters Patent. **Patented Sept. 28, 1920.**

Application filed June 9, 1919. Serial No. 302,788.

To all whom it may concern:

Be it known that I, ADDISON W. BROCK, a citizen of the United States, resident of Baltimore, Maryland, have invented certain new and useful Improvements in Bronzing-Machines, of which the following is a specification.

The invention consists in the features and combination and arrangement of parts hereinafter described and particularly pointed out in the claims.

In the accompanying drawings:

Figure 1 is a vertical longitudinal sectional view of a part of the machine in position at the end of the offset press or other printing press.

Fig. 1ª is a view of the transfer grip mechanism with its parts in position just before transferring the sheet from the grips of the offset press to the grips of the bronzing machine, this position of the parts being that just prior to the relative positions of the grippers in Fig. 1.

Fig. 1ᵇ is a view similar to Fig. 1ª with the parts in the position after the sheet has been transferred, that is, after the front end of the sheet has been released by the grips of the offset press and has been taken by the grips of the bronzing machine.

Fig. 2 is a side view of the bronzing machine connected with the end of the off-set press.

Fig. 3 is a plan view of the parts shown in Fig. 2.

Fig. 4 is a plan view of the sheet transferring mechanism at the juncture of the bronzing machine with the off-set press.

Fig. 5 is a detail view of one of the bronze rubbers.

Fig. 6 is a detail view of the mechanism for operating the bronze supply roll.

Fig. 7 is a view of a casing by which the operative parts may be inclosed.

Fig. 8 is a view of the connection between the apron and one of the gripper bars.

Fig. 9 is a detail view of a modification of the gripper bar and belt arrangement whereby the belt and gripper bars make practically a closed circuit without a gap.

In Fig. 1 one of the delivery chains of the ordinary off-set press is shown at 1. These ordinarily are employed to deliver the printed sheets to a jogger board from which they are taken by an attendant when a pile of sufficient number of sheets has been built up. There is one of these chains at each side of the off-set press as indicated in Fig. 3.

This pair of chains carries brackets 2 in which is mounted a rock shaft 3 adapted to turn in said brackets. This shaft carries a plurality of grip fingers 4 fixed to the shaft. The chains also carry brackets in which is fixed a rod or bar 5, on which are fixed the grip members 6 which are companions to the movable grip fingers 4. The grip fingers engage the front end of the printed sheet but instead of delivering the sheet to a jogger board they carry it so that its front end is transferred to grippers on the bronzing machine as presently will be described. For releasing the sheet for this transferring action to take place the shaft 3 is turned at the proper moment or just after the parts have assumed the position shown in Fig. 1. This turning of the shaft 3 is done by an arm 3′ fixed thereon having a roller 3″ which works against a cam edge 7 on the cam member 8 of the offset press. In Fig. 1ª the printed sheet is represented at *x* gripped between the fingers 4 and the companion members 6 and the parts are being carried in the direction of the arrow by the chains 1.

Fig. 1ᵇ represents the parts 4 and 6 as having released the sheet due to the opening of the fingers 4 by the arm working with its roller on the cam edge 7 and in this Fig. 1ᵇ the sheet has been gripped by the fingers 10 against the companion grip 11. The gripping fingers 10 of the bronzing machine are mounted on a shaft 12 adapted to have rocking movement in brackets 13 secured to the links of the chains 14 of the bronzing machine and the complementary grip 11 is mounted fixedly on extensions of these brackets.

The shaft 12 is operated by an arm 15 thereon carrying a roller 15′ working against the edge of a cam member or track 16 which is hung on a shaft 17 mounted in the frame.

The rock shaft 12, as also the rock shaft 3, is spring operated in one direction, these springs being shown respectively at 12^x and 3^x. One end of each spring is connected with the arm it is to operate and the other end is connected to a collar one for each spring, marked respectively 12^y and 3^y. These collars are held on the shafts by pins 18 engaging one of a series of notches in the

collars, so that the tension of the springs may be changed to suit conditions. The cam member 16 is held in proper position by a rod 16′ connected therewith and with the main frame at 19.

The rod is screw threaded and may be adjusted to properly set the cam member by nuts 20.

The chains 14 of the bronzing machine which carry the grippers 10 and 11 must, of course, work in proper time with the chains 1 which carry the grippers 4 and 6, so that the paper sheet will be transferred from the grippers of the off-set press to those of the bronzing apparatus without damage. In this transferring operation, as above intimated, the grippers of the bronzing machine are timed to engage the front edge of the sheet while it is still engaged and is being transported by the grippers 4 and 6 of the off-set press, Fig. 1[a] representing the relation of the parts when the grippers 10 and 11 of the bronzing machine are about to engage the front edge of the sheet, Fig. 1 representing both sets of grippers engaging the sheet and Fig. 1[b] representing the sheet as having been released by the grippers of the off-set press and being transported by the grippers of the bronzing machine. The grippers of the off-set press release the sheet as soon as it is engaged by the grippers of the bronzing machine and the transfer begins to take place, as shown in Fig. 1[a], just before the front edge of the sheet reaches the horizontal plane in which lie the axes of the sprocket wheels 21, 22, about which the chains 1 and 14 of the off-set press and bronzing machine are directed and the transfer is completed by the release of the off-set grippers 4 and 6 and the engagement with the sheet of the grippers 10 and 11 of the bronzing machine as the front edge of the sheet is crossing this horizontal plane, so that damage to the sheet will be prevented.

In order to secure harmonious action of the grippers of the off-set press and bronzing apparatus with respect to each other the chains 1 and 14 are driven in unison for which purpose the shafts 21[x] and 17 carrying the sprockets 21 and 22, respectively, are geared together by spur gearing 24 and 25 and as before stated the cam member or track 16 is adjustable so that the grippers of the bronzing machine may be operated in proper time with those of the off-set press.

The chains 14 move in the direction of the arrow, Fig. 1, and the sheet having been taken by the grippers 10 and 11, it is carried up to the right in Fig. 1 and beneath a roll 26 which delivers bronze powder to the sheet as it passes beneath it.

The carrier for the sheets is composed of the chains 14 and bridge bars 27 extending across from chain to chain and furnishing rests or supporting means for blankets or aprons 28. There are two sets of grippers 10 and 11 for the carrier disposed at points equally distant along the chain and these grippers operate through spaces where the bridge members are omitted, *i. e.*, through the spaces between the bridge members 27[a] and 27[b]. The forward end of each apron or blanket is secured to the angle gripper bar 11 by a wedge shaped plate 29, see Fig. 8, held by bolts 30 passing through the angle bar, also through a filling piece 31 with the heads of the bolts pressing upon the plate 29 and clamping the front edge of the apron or blanket in place. The trailing edge of each blanket is similarly secured to the bridge bar 27[b]. This construction leaves a space between the angle gripper bar and the bridge bar 27[b] where there is no blanket. In this space the gripper 10 and its operating arm works. The bridge bars are preferably hollow and may be formed of channeled metal. They present closely set flat surfaces upon which the blankets or aprons rest and these blankets may be of rubber or other suitable material affording good backing upon which the printed sheets rest with their upper faces containing the impressions exposed for receiving the bronzing material.

The bronze supplying roller 26 is arranged closely above the apron or blanket. It is arranged in a box or hopper 32 containing the bronzing material which is directed to the roller by a shield 32′. The space for containing the bronze material may be adjusted in size to suit the width of the sheets to be bronzed or to suit different widths of impressions on said sheets by adjustable partitions or end walls 33 which may be shifted to different positions along the roller, it being noted that these partitions embrace the roller, they being of forked form.

This bronze supply roll is rotated intermittingly while the sheet carrier moves continuously. At each movement of the roller enough of the bronzing material is carried down to answer for the entire sheet being carried beneath it. The roller is moved once for each sheet to be bronzed. This intermittent movement is imparted to the roller through a ratchet wheel 34, Fig. 6, operated by a pawl 35 carried by an arm 36 oscillated by a bar 37 having a roller 38 against which the cam 39 works, said cam being fixed to a shaft 40 driven by gearing 41, 42, from the shaft upon which the sprocket wheels 22 are mounted.

The roll when turned to bring down the required amount of bronze material comes to rest while the sheet is carried past it and wipes the bronze therefrom, taking enough for the requirements of the area of the impression. Only a small part of the periphery of the roll is exposed at the bottom of the box.

After leaving the bronzing roll the sheet passes under rubber devices which distribute the bronze upon the surface of the impression and rub it down.

These rubber devices may assume different forms but in the particular machine illustrated they consist of rods 43 slidable in bearings 44 transversely of the length of the sheet. These bars carry collars 45 through which hanger bolts 46 extend which support at their lower ends the plate 47 which is covered with plush or like material having a yielding surface. This plush material extends over the lower face of the plate and over the top face and it is clamped in position by a plate 48 pressed down thereon by springs 49 which seat at their upper ends against the bottoms of the collars. The plush may be perforated at one edge to be threaded onto the hanger bolts. By adjusting the nuts 50, Fig. 5, of the several hanger bolts the rubber bar may be adjusted to bear on the surface of the sheet evenly at all points to secure a uniform light rubbing action thereof. The hanger bolts may be set in any adjusted position by lock nuts 51.

The rubber bars are reciprocated longitudinally by pitmen 52. Fig. 3, operated by cranks 53 of a shaft 54 which is driven through sprockets at 55, 55′ and a chain 56, the sprocket 55 being on a shaft 57 driven by belt pulley 58.

After leaving these rubbers the sheet is carried beneath burnishing rolls 59, three of these being shown. These rolls are made up of disks of textile material like muslin threaded onto the shafts 60 and held by collars 61 pinned on the shafts. These rollers present soft fibrous surfaces which burnish the bronze covered surface. The shafts of these rollers are mounted in suitable bearings and they are driven by a belt 62 from a wheel 63 on a shaft 64 which is driven by bevel gearing 65, 66, from the shaft 57.

The burnishing rollers may be adjusted in relation to the sheet being operated on by screws 67 connected with the bearing blocks in which the rollers are mounted. The screws are turned by hand wheels 68.

The sheets after being bronzed are delivered from the machine by chains 70, one on each side of the machine which carry grippers similar to those referred to in connection with the carrier chains 1 of the off-set press and as this mechanism has been fully described above it is not thought necessary to repeat it here further than to point out that the grippers of the delivery chains take hold of the end of the sheet as delivered thereto by the grippers 10, 11 of the bronzing machine and carry them to any suitable form of jogger board or like receiver.

The delivery chains are driven in unison with the chains 14 of the bronzing machine through gearings at 71, 72. The chains may be kept sufficiently taut by screws 73 for the sheet carrying chains and by the turn buckle 74 for the delivery chains.

It will be observed that while a finished sheet is being delivered at one end of the bronzing machine, a new sheet is being introduced to the bronzing machine from the off-set press so that the sheets follow each other through the bronzing machine in close order and the machine has a high rate of production.

A casing such as shown in Fig. 7 may be used to inclose the parts.

The bronzing machine is mounted on rollers 75 by which it may be shifted from one place to another in the establishment to work with different off-set presses as the demands of the work may require.

Reverting to the bronzing roll, this is covered by suitable material such as plush which will take up the bronze material and deliver it upon the sheet. The roll may be given different degrees of movement to regulate the amount of bronze which will be delivered to the sheet.

For this purpose the pawl and ratchet drive may be regulated in any suitable way, such as providing a shield 34′ for the ratchet to make the pawl's effective stroke variable as to the number of teeth of the ratchet which it will take.

It will be seen that the sheet-carrier mechanism of the bronzing machine has two sets of grippers so that while one set is taking a sheet from the offset press or other press the other set of grippers is transferring the preceding sheet to a delivering mechanism. Thus the bronzing machine can be run at a low rate of speed and in the illustration shown this would be half the speed of the press. It may be employed therefore with the fastest presses which revolve, say at a speed of from 3000 to 4000 R. P. H.

The bronzing machine has no cylinders but instead its sheet carrier is made up of the chains which move linearly for the greater portion of their travel. The machine can be built low to the floor and hence is adapted for association with the delivery of the off-set press. In order to associate the bronzing machine with the off-set press the point in the travel of the sheet carriers at which the sheets are released by the grippers is changed, that is to say, the cam member 8 is substituted for the usual cam on the offset press, so that instead of the grippers releasing the sheet while they are still in the same horizontal plane with the lower stretch of the carrier chain to thereby drop the sheet onto the jogger board, the release in the present machine does not take place until the forward edge of the sheet has been carried up to the horizontal plane in which the

axes of the sprocket wheels lie or in other words at the point where the path of the grippers of the bronzing machine meets with the path of the grippers of the offset press.

The offset press is readily altered for securing this action by simply substituting the cam member 8 for the cam member usually employed.

By associating the bronzing machine directly with the offset press no attendant is necessary to feed the bronzing machine, no special feeding devices, tapes, carriages or the like, and the action is entirely automatic.

The same jogger board ordinarily used to receive the sheets from the offset press is removed from its usual position and is placed at A under the delivery chains or belts, and it may be operated by simply making an extension of the same connection ordinarily used.

It will be observed that the bronzing machine, by reason of its use of the endless chain carrier with upper and lower substantially horizontal stretches, sets low to the floor and may be used with offset presses as now built, the only change in the offset press being to alter the delivery point of the printed sheets. Ordinarily the delivery from the offset press takes place upon a jogger board and consequently the forward end of the printed sheet is released before it begins to rise along the segmental or curved path around the axis of the sprocket wheels which carry and direct the chains.

It is only necessary therefore to substitute the member 8 with its cam edge 7 for the usual cam of the offset press so that the release of the sheet will take place when its forward edge arrives at the level of the center about which the segmental path is described or in other words when the forward edge of the printed sheet arrives at the point where the two carriers, one on the press and the other on the bronzing attachment, intersect or meet, this point in the construction shown being in the plane in which lie the axes of the sprockets 21 and 22 which direct the carrier at the turns.

It will be observed also that while the bronzing machine is built low for association with the delivery end of the offset press its own delivery is elevated in respect to the point where it takes the sheets from the offset press because of the use of the delivery carrier 70, the lower stretch of which takes the sheets from the chains or carrier 14 and delivers them to a jogger board.

In setting the bronzing machine into connection with different offset presses it is only necessary to shift it into proper alinement with the press with the spur gears 25 meshing with the spur gears 24 and then the bronzing apparatus will be driven in proper time with the offset press so far as its carrier is concerned, this being driven directly from the carrier mechanism of the offset press. It is not important that the bronze supplying means—the rubbing means and the burnishing means be driven from the offset press and I have therefore shown driving connections independent of the offset press for operating these parts.

In order to hold the bronzing machine in place when shifted into connection with the offset press I provide links 24^x which may be connected to any suitable part of the offset press and to the bronzing machine. These links may be mounted on projecting ends of the shafting and held by nuts or collars. They serve to hold the bronzing machine in proper alinement with the delivery means of the offset press.

The chain carriers of the bronzing machine may be guided by any suitable frame parts, such as the guide bars 14^x and 70^x.

As shown in Fig. 9 I provide an arrangement by which the belt may be continuous without any gap therein. This will prevent bronze from getting down within the circuit of the belt.

The arrangement consists in having one end of the belt held by screws in a socket 10^a of a gripper bar 10^b which extends across the machine. This bar coöperates with another gripper bar 11^a with which the other end of the belt connects by a socket 11^b and screws. These bars are operated by the chains, as in the first form, the bar 10^b having ears 10^c by which it is hung on the shaft 12. This gripper has notches or recesses 10^d which receive the fingers 4.

What I claim is:—

1. A bronzing machine comprising an endless carrier having an arc shaped path at one point and a substantially horizontal path at another point, an apron connected to the carrier to be moved thereby, grippers on the carrier with means for operating them to take the sheets while traversing the arc shaped path, means having grippers for delivering the sheets to the grippers first mentioned, said means traveling in a path, which adjacent the delivery point is arc shaped and reversed in respect to the arc shaped path of the grippers first mentioned, and bronze supplying means to deliver bronze to the sheets while traversing the substantially horizontal portion of the path of the carrier and its apron, substantially as described.

2. A bronzing machine comprising an endless carrier having an arc shaped path at one point and a substantially horizontal path at another point, an apron connected to the carrier to be moved thereby, grippers on the carrier with means for operating them to take the sheets while traversing the arc shaped path, means having grippers for delivering the sheets to the grippers first mentioned, said means traveling in a path, which

adjacent the delivery point is arc shaped and reversed in respect to the arc shaped path of the grippers first mentioned, and bronze supplying means to deliver bronze to the sheets while traversing the substantially horizontal portion of the path of the carrier and its apron and means for supporting the apron as it traverses the horizontal path, substantially as described.

3. A bronzing machine comprising an endless carrier having an arc shaped path at one point and a substantially horizontal path at another point, an apron connected to the carrier to be moved thereby, grippers on the carrier with means for operating them to take the sheets while traversing the arc shaped path, means having grippers for delivering the sheets to the grippers first mentioned, said means traveling in a path, which adjacent the delivery point is arc shaped and reversed in respect to the arc shaped path of the grippers first mentioned, and bronze supplying means to deliver bronze to the sheets while traversing the substantially horizontal portion of the path of the carrier and its apron and means for supporting the apron as it traverses the horizontal path, said supporting means comprising cross bars on and moving with the carrier and within the circuit of the apron, substantially as described.

4. A bronzing machine having means for supplying the bronzing material, endless carrier means having grippers for transporting the sheets, said carrier means moving along a substantially straight path at the point where the bronze is applied thereto and having means at opposite ends of the carrier for opening and closing the grippers to receive the sheets at one end and deliver them at the other end, substantially as described.

5. A bronzing machine comprising an endless carrier, guide wheels about which said carrier moves with its upper and lower stretches substantially horizontal, grippers on the carrier for taking and releasing sheets, and means for supplying bronze to the sheets as they are being transported by the carrier.

6. In combination in a bronzing machine, a carrier for the sheets, a hopper for supplying the bronze material, a roller at said hopper having a portion of its periphery exposed at the lower end of the hopper for the delivery of the material onto the sheet, means for rotating the roller and adjustable means for limiting the length of the hopper space available for holding the bronze and consequently the effective length of the roll, substantially as described.

7. In combination with a sheet carrier, means for supplying bronze to the sheets, a rubber comprising a bar reciprocating transversely of the line of travel of the sheet, hangers passing through the rod, a rubbing member on the lower ends of the hangers to contact with and rub on the sheets, and springs interposed between the said rubbing member and the lower side of the bar or rod, said hangers being movably mounted in the bar, substantially as described.

8. In a bronzing machine, a carrier consisting of sprocket chains, having grips for the sheets and having a blanket or apron between the chains moving therewith and upon which the sheets rest, apron supporting bars connected with the chains upon which the apron rests, and means for applying bronze to the sheets while being transported along a horizontal path by the chains and apron supported by the bars and sprocket wheels about which the chains pass.

9. In combination, sprocket wheels, chains passing about said sprocket wheels, gripper means carried by the chains for grasping and transporting the sheets to be bronzed, bridge bars extending between and connected with the chains, an apron resting on the bridge bars and moving in unison with the chains and bars and means for applying bronze to the sheets while being transported and while supported by the apron and bridge bars, substantially as described.

10. In combination, a pair of endless carrier chains moving at one point along a substantially horizontal path, gripper means carried thereby to grasp sheets to be bronzed, a rock shaft extending between the chains, mounted thereon and carried thereby, an arm on the rock shaft, a cam fixed relatively to the chains for operating the arm and rock shaft, grippers on the rock shaft coöperating with the gripper means first mentioned, bars extending between the chains and connected therewith, an apron resting on the bars and traveling with the chains and means for supplying bronze upon the sheets while supported by the apron along the substantially horizontal path thereof, substantially as described.

11. In combination, a pair of endless carrier chains, moving at one point along a substantially horizontal path, a gripper bar carried thereby, coöperating gripper means, operating means for the latter to grip sheets to be bronzed and an apron secured to the gripper bar at one end and extending along and between the chains for the sheets to rest upon, means for holding the other end of the apron to the chains, said gripper bar being of angle form in cross section, a filling piece secured thereto to which the end of the apron is secured, cross bars connected with the chains upon which the apron rests and means for treating the sheets while resting on the apron along the substantially horizontal stretch thereof, substantially as described.

12. In combination with carrier means for

transporting sheets, means for supplying bronze to the sheets, and rubbing means comprising a plate or bar, hangers for holding the same, an upper plate, springs for pressing the upper plate toward the lower plate and textile material extending over the lower face of the lower plate with its edges held between the plates, substantially as described.

13. A bronzing machine comprising an endless carrier with means for directing it with upper and lower horizontal stretches and curved end paths, grippers on the carrier, means for operating the grippers to take sheets to be bronzed at a point substantially midway of the curved end path and means for applying bronze to the sheets while being transported by the carriers, substantially as described.

14. In combination with the delivery means of a printing press comprising carrier means with grippers and operating means therefor to cause them to release the printed sheets, a bronzing mechanism having a carrier with grippers for the sheets, the path of said carrier meeting at one point, and means for operating the grippers of the bronzing mechanism when they reach said meeting point to grasp the edge of the sheet just prior to its release by the grippers of the printing press, and means for adjusting the relative action of the grippers, substantially as described.

15. In combination with a delivery carrier of a printing press having grippers for printed sheets, a bronzing attachment having endless carrier means for receiving the sheets and having grippers for the sheets moving at its upper stretch along a horizontal path to grasp them when they are about to be released by the delivery grippers at the meeting curved paths of said carriers, means for operating the grippers of the delivery carrier and of the bronzing machine in proper sequence, means for applying bronze to the printed sheets and delivery means for the bronzing machine comprising endless carrier means having a horizontal lower stretch and having grippers and means for operating said grippers to take the printed sheets from the grippers of the carrier of the bronzing machine where said upper and lower stretches of the carriers meet and for delivering the sheets at a point of discharge, substantially as described.

16. In combination with an endless chain delivery carrier of a printing press having grippers for the printed sheets, means for directing said carrier in a path forming the segment of a circle, a bronzing machine having an endless chain carrier with grippers for the printed sheets, said carrier also moving along a segmental path at one but reversed from the path of the delivery carrier, said paths meeting in the plane of the centers from which the said segmental paths are struck and means for operating the grippers of the delivery carrier to release, and the grippers of the bronzing attachment to receive, the front edge of the sheets when they arrive at the meeting point of said paths, and bronze applying means, said endless chain carrier of the bronzing machine moving along a straight substantially horizontal path immediately after taking the sheet, over which horizontal path the bronzing means is located, substantially as described.

17. In combination with a delivery carrier of a printing press having grippers for the printed sheets, means for directing said carrier in a path forming the segment of a circle, a bronzing machine having an endless carrier with grippers for the printed sheets, said carrier having an upper horizontal stretch and moving along a segmental path at one end but reversed from the path of the delivery carrier, said paths meeting in the plane of the centers from which the said segmental paths are struck and means for operating the grippers of the delivery carrier to release, and the grippers of the bronzing attachment to receive, the front edge of the sheets when they arrive at the meeting point of said paths, and an endless delivery carrier for the bronzing machine having grippers with means for operating the grippers of the bronzing carrier and of the delivery carrier where said grippers meet along the upper stretch of the bronzing carrier, substantially as described.

18. In combination with the delivery carrier of a printing press, moving at one point along a segmental path, grippers on the carrier with means for opening said grippers to release the sheets as they are rising along said segmental path, a bronzing attachment having an endless carrier with grippers to take the sheets as released and as the latter grippers are rising along a segmental path reversed to that of the delivery carrier of the press, the said endless carrier thereafter moving along an upper stretch in a horizontal path, a bronzing means to supply bronze while the sheet is moving horizontally, and a delivery carrier having grippers to take the sheets from the upper stretch of the bronzing carrier, substantially as described.

19. In combination in a bronzing machine endless carriers moving at one point along a substantially horizontal stretch, grippers on the carriers for taking sheets directly from an offset or other press, a belt substantially of the width of the sheets connected with the said grippers and forming therewith a continuous surface for receiving the sheets and supporting said sheets substantially throughout their extent, means for supporting said belt and means for applying bronze to the sheets while carried

and supported by the said belt along the substantially horizontal stretch, substantially as described.

20. A bronzing machine comprising a substantially endless flexible carrier for the sheets to be bronzed, moving at one point along a substantially horizontal path, grippers moving with the carrier, supporting means for the flexible carrier moving in unison therewith, and means for supplying bronze to the sheets while passing along the horizontal path, substantially as described.

21. In combination with the delivery means of a printing press, a bronzing machine comprising a substantially endless flexible carrier for the sheets to be bronzed, moving at one point along a substantially horizontal path, grippers moving with the carrier, supporting means for the flexible carrier moving in unison therewith, and means for supplying bronze to the sheets while passing along the horizontal path, the said delivery means of the printing press delivering the sheets directly to the grippers of the flexible carrier of the bronzing machine, substantially as described.

In testimony whereof, I affix my signature.

ADDISON W. BROCK.